1987
ANNUAL
REPORT

ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

Alberta
AGRICULTURE

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DIRECTOR'S REPORT

The Alberta Tree Nursery and Horticulture Centre (ATN&HC) is a branch of Alberta Agriculture, Plant Industry Division. The Centre, located in north-east Edmonton at 17507 - 18 Street, is responsible for several diverse horticulture programs. The major programs are production oriented toward tree and shrub production for the farm shelterbelt program and Provincial Parks program. The other responsibilities deal with major extension efforts such as the province wide woody plant and non-commercial extension research programs, Regional extension and research programs in Vegetables and Protected Crops. A quickly developing expertise and research is the Tissue Culture Centre dealing with all plant crops. Product testing trials are carried out on a selective basis.

ALBERTA TREE NURSERY & HORTICULTURE CENTRE - STAFF 1987

George Grainger	Director

ADMINISTRATION:

Patricia Fowler	Office Manager
Michele Dannish	Secretary
Shelley Draper	Word Processor
Vicki Noel	Courier

Changes and program expansion at the Centre necessitated some major reallocation of duties within the Administration Section during the year. Michele Dannish retained the secretarial duties and Shelley Draper assumed the word processing responsibilities. In October, Helen Rekrut was hired in a wage position to carry out the receptionist duties.

VEGETABLE SECTION:

Belinda Choban	Vegetable Specialist

The vegetable section took on a totally new look. Phil Dixon, the Vegetable Specialist, left to make his mark with the Edmonton Potato Growers and was replaced by Belinda Choban. Pearl Balbar's retirement resulted in the appointment of Craig Maxwell as the vegetable technician, however, by year end that position was again vacant.

HORTICULTURE EXTENSION:

Betty Vladicka	Horticulture Extension Specialist

GREENHOUSE SECTION:

Dr. Mirza Mohyuddin	Greenhouse Specialist
Alena Straka	Tissue Culture/Greenhouse Technician

SHELTERBELT PROGRAM:

Brendan Casement	Shelterbelt Specialist

Shelterbelt Production:

Brian Breneman	Production Technologist
Rulie Bok	Gardener
Patricia Elliott	Gardener

Arboretum and Grounds:

Thean Pheh	Gardener
Henry Brown	Gardener

Container Production:

Cecilia McIsaac	Container Technologist
Joan Sumka	Gardener
Sophie Eckberg	Gardener

Seed Orchards:

Doreen Koladich	Gardener
Nancy Moroz	Gardener

Warehouse:

Vacant	Agriculture Officer

Chemicals and Seedling:

Doug Lehman	Gardener
Kevin Thorpe	Gardener

The staff in the Shelterbelt Section regretfully said goodbye to Herman Oosterhuis, who retired in May. Herman was responsible for many changes in the nursery industry and had held the position of Shelterbelt Specialist for 20 years.

Brendan Casement, who had been located at the Alberta Special Crops and Horticulture Research Center in Brooks, assumed the role of Shelterbelt Specialist.

At the same time, Lydia Erickson's decision to take advantage of the Early Retirement Incentive Program left the warehouse without a custodian. This position was not filled at year end and will be reallocated to the Tissue Culture Centre as Lab Scientist.

The final staff change came with the transfer of Sophie Eckberg from the Grounds and Arboretum Section to the Container Section.

Farm Services Section:

Al Faulkner	Gardener
Dave Wearmouth	Gardener
Cyril Cooreman	Gardener
Bruce Chedzoy	Gardener
Paul Gervais	Auto Mechanic
Stan Bootsma	Auto Mechanic
Gerhard Dames	Welder
Brian Petherbridge	M.S.W.
Steve Milne	M.S.W.

Fortunately, this section was not affected by staff departures but instead welcomed the appointment of Stan Bootsma as automotive mechanic in the three year project position.

G. Grainger, P.Ag.

METEOROLOGICAL REPORT 1987

Table I. Maximum, Minimum and Mean Temperatures at Alberta Tree Nursery and Horticulture Centre.

MONTH	MAXIMUM MEAN °C	MINIMUM MEAN °C	MEAN °C	EXTREME HIGH	EXTREME LOW
January	.03	-10.6	-5.3	10.0	-18.5
February	1.2	- 7.9	-3.4	8.0	-22.0
March	-3.2	- 9.0	-6.3	13.0	-21.0
April	13.2	0.8	7.0	27.5	- 5.5
May	19.0	5.4	12.2	30.0	- 1.5
June	23.0	10.5	16.7	28.5	6.5
July	23.4	10.5	17.0	32.5	5.0
August	18.7	8.4	13.5	25.0	3.5
September	20.3	6.4	13.4	27.5	0.5
October	12.2	0.5	6.4	29.0	- 9.0
November	5.4	- 3.9	0.8	13.0	-11.5
December	0.5	-10.0	-9.5	9.0	-23.0
AVERAGE	11.1	0.09	5.2	30.0	-23.0

Table II. Precipitation in 1986.

MONTH	RAINFALL MM	SNOWFALL CM	TOTAL MM
January	1.4	3.8	5.2
February		7.6	7.6
March	1.8	15.2	17.0
April	21.2	0.6	21.8
May	43.5	20.5	63.5
June	33.2	--	33.2
July	106.2	--	106.2
August	101.8	--	101.8
September	49.6	--	49.6
October	2.2	--	2.2
November	1.0	0.2	1.2
December	--	7.4	7.4
TOTAL	361.9	55.3	417.2

First and last killing frost dates: April 25 - October 9, 165 days

THE NURSERY INDUSTRY - Brendan Casement

Commodity Review:

Recovery from the economic decline was evident in the Landscape Industries. The sale of smaller size woody plants increased. There were a few large landscaping contracts awarded, giving a much needed impetus to the landscape contractors.

The 'Best in the West' Trade Show, with over 150 booths, was again held in conjunction with the annual convention of the Landscape Alberta Nursery Trades Association. It was reported that the membership had increased by 34% in 1987. The Province's First Lady, Mrs. Margaret Getty, planted two Lodgepole pines on the Legislature grounds for Arbor Day and made presentations to the winners of LANTA's Environmental Awards Program. The Alberta Nursery Industry Marketing Committee again organized a successful Sales Seminar in Airdrie.

Four Nursery Growers meetings were attended to present research reports and partcipate in related discussions. As a member of the Alberta Nursery Industry Marketing Committee presented a paper on Alberta Nursery Production to the Alaska Greenhouse and Nursery Growers Annual Meeting.

Shelterbelt Program - Brian Brenemen and Rulie Bok

Table III. Tree Distribution, 1987 Provincial Summary.

Regions	Applications	Tall Deciduous	Small Deciduous	Hedge	Evergreen	* Total
Lethbridge	1,355	119,850	30,370	448,525	57,430	656,538
Calgary	865	89,925	17,875	328,450	46,290	482,816
Red Deer	1,000	99,300	14,375	118,800	66,410	299,207
Vermilion	1,207	109,100	16,725	83,925	85,250	295,394
Barrhead	753	54,750	12,025	54,450	43,115	164,604
Fairview	1,050	86,600	29,025	135,375	53,460	304,841
Total	6,230	559,525	120,395	1,169,525	351,955	2,203,400

*The total includes the 1,000 Conservation bundles distributed throughout the province.

Propagation:

a. Poplar and willow cuttings, totaling 1.23 million and prepared during the winter, were field planted between May 26 and June 7 using three planting machines. Only 288,950 rooted cuttings were graded out; the 24.1% return could be due to one or more of the following:

   i) Poor emergence of Griffin poplar and peach leaf willow
   ii) Substantial plantings in low lying areas in certain fields
   iii) an unidentified root problem that occurred in some laurel leaf willows
   iv) grading standards were substantially higher

b. Spring and fall seedings were carried out with 309 kg of seed being seeded in approximately 14,000 m of seed bed and on 2.64 ha (caragana).

c. Transplanting of spruce and pine took place in early June 1987, with 565,000 being transplanted in eight working days.

d. Spring lifting of the coniferous materials started on April 11 and finished mid-May. Shipping took place between April 23 and May 20, and included 76 bundles for 4H clubs and 102 'Forever-a-Tree' bundles. Fall lifting was delayed in 1987 by the unusually warm weather with the resulting leaf retention, but once underway the warm dry weather facilitated lifting.

e. Labour requirements for weeding were heavy in 1987, in that the weeds demanded the attention of a larger workforce during the rainy spell of late July and August. However, the fine weather in September again worked to advantage in that the weeds were removed before harvest was possible.

Grounds and Arboretum - Thean Pheh

There were almost 2,000 bedding plants utilized on the grounds in 1987. This figure is lower than that of previous years, as 25 types of perennials were included in the plantings. A new pinetum was started with two plants each of 34 taxa being planted and an area has been incorporated in it for turf grass cultivars. Seven species of Caragana were added to the McCalla Arboretum and a plan for an edible plant arboretum has been developed. The severe May frost and snow did considerable damage to many of the woody plants, killing 'Patmore' green ash and extra pruning was required. The tornado in late July also caused damage and again, extra efforts were required to clean up the affected plants.

Container Program - Cecilia McIsaac

There are two parts to this program:

i) the small containers, where plants are seeded into containers with a volume of 37 or 160 ml and grown out in the greenhouses, and

ii) the large container, where the plants in small containers are transferred to one gallon polyethylene 'pots' and grown on. These may be transferred later to two, five or seven gallon pots, depending on Provincial Parks requirements.

In 1987 both evergreen and deciduous material was damaged by the heavy snow and severe frost in May when all the plants were growing rapidly.

Small Containers

Production of 808,470 plants was divided between parks and shelterbelt programs.

Table IV. Number of plants produced in 1987 in small containers.

Program	Deciduous	Coniferous	Total
Shelterbelt	78,560	575,328	653,888
Parks	146,256	8,326	154,582
Total	224,816	583,654	808,470

Of these 32,194 seedlings of Colorado spruce or Lodgepole pine were distributed for Arbor Day programs throughout the province.

Large Containers:

The Provincial Parks received 12,314 large containers, 9,007 of which contained deciduous plants. Parks personnel provided the seeds or cuttings of the native plants which, when grown out, produced 159,382 liners to be grown untill of the required size for planting. 57,233 plants were repotted.

Seed Collection and Extraction - Doreen Koladich

Seed collection, considerably reduced in 1987, was limited to those species that flowered and fruited after the severe frost of May 19, resulting in only 24 species being collected in and around the

Edmonton area. Additional seed was received from the P.F.R.A. Shelterbelt Centre, Indian Head, Saskatchewan (1 kg cherry princepia and 3 kg of highbush cranberry); the Agriculture Canada Research Station, Morden, Manitoba (9 kg of bur oak) and the Alberta Special Crops and Horticultural Research Center, Brooks (9 kg of Russian olive).

There were 21 sales of seed with 8 kg of seed being released. A further 12.8 kg of seed was provided to the successful bidders for the contract growing of shelterbelt material.

Seed was extracted from 4 bushels of lodgepole pine cones for Greg River Resources.

Table V. Seed collection summary, 1987.

Species	Fruit/cones collected (kg)	Cleaned seed released (kg)
Tall deciduous	43	8
Small deciduous	927	33
Hedge plants	258	52
Coniferous plants	572	13
Total	1,800	106

Woody Plant Investigations - Thean Pheh

Almost 700 plants were lifted and distributed to the six other test sites of the Regional Woody Plant Project, while 143 trees or shrubs were planted on the site at the Centre.

Those plants that winter killed in the Shrub Fertilizer trial were replaced, and 336 young trees were planted in a Tree Fertilizer trial. The fertilizer trial section consists of 16 fertilizer treatments on three replications with seven taxa trees.

The willow varietal trial was only lightly damaged by the frost on May 19. Roger Vick of the Devonian Botanic Garden reviewed them for trueness to type. Most of the 13 poplars in the poplar trial were badly injured by the May frost, with the Northwest poplar being the least injured.

GREENHOUSE EXTENSION PROGRAM - Mirza Mohyuddin

Commodity Review:

Nineteen Eighty Seven was a stable year for the Alberta Greenhouse Industry. The most serious problem faced by the vegetable growers was Thrips, which caused yield losses to seedless cucumber growers. Thrips have developed a resistance to almost all of the registered chemicals.

The area under cover continued to expand, mostly designated for tomatoes: 1) almost 3600 sq. m of new area was committed to Alstromeria production, 2) lettuce production expanded to 2000 sq. m using nutrient film technique, and 3) a further 1600 sq. m was devoted to seedless cucumber production, again using the nutrient film technique.

Bedding plant production remained stable. Serious crop losses were reported by some greenhouses from the snow storm and below freezing temperature on May 19th, 1987. Poinsettia and Easter Lily crops were on time and of good quality.

The Alberta Greenhouse Growers' Association continued to progress well during 1987. The association joined with the Market Gardeners Association and the Alberta Fresh Vegetable Marketing Board to form the Alberta Horticulture Congress. The convention under this new organization was held in Red Deer and was a great success. The Alberta Greenhouse Growers' Association also held several workshops in different areas of the province.

Alberta Agriculture continued to provide extensive back up to greenhouse growers. Alberta Agriculture's Soil and Animal Nutrition Laboratory again provided soil and nutrient analysis on a priority basis. A few greenhouse operations in the province obtained funding from the Alberta Agriculture Development Corporation.

Greenhouse Extension and Research:

1987 was a very busy year for the greenhouse program at the Alberta Tree Nursery and Horticulture Centre. Gordon Grant, Greenhouse Specialist at the ASCHRC in Brooks, resigned to join the Ministry of Agriculture in British Columbia. Consequently a large portion of time was spent in southern Alberta to provide the industry in that region with extension service.

Recommending fertilizer levels based on soil tests was a major responsibility, especially with the increase in the number of samples submitted for analysis by Interior Landscapers.

Alberta Greenhouse Notes continued to be an important tool for disseminating information to the growers. It circulated to more than 400 growers.

Dr. Mirza Mohyuddin attended all Board meetings of the Alberta Greenhouse Growers Association and assisted in the organization and teaching of several workshops. He also gave three talks at the Fifth Annual Convention of the Association.

Dr. Mirza Mohyuddin was invited to be a guest speaker and attended the American Greenhouse Vegetable Growers' Association in Vancouver, the Nova Scotia Greenhouse Growers Association meeting at Truro taught a greenhouse course sponsored by the University of Saskatchewan, and also taught a Fertilizer Management course to interior landscape group at Olds.

Greenhouse information was provided to about 200 people who were interested in starting a greenhouse business, fifteen proposals for the AADC and other agencies were evaluated, the Hobby Greenhouse publication was revised and submitted for printing, and the Poinsettia Production booklet was revised for the Alberta Greenhouse Growers' Association.

Greenhouse Investigations:

Mirza Mohyuddin, Kris Pruski, Alena Straka and Geraldine Horan

A modest greenhouse demonstration/research program was maintained for growers to visit and obtain first hand knowledge of crop management.

1. Effect of Sodium Silicate and Ferrum Phosphate on the Yield of Seedless Cucumbers in a Hydroponic System.

   Nutrient Film Technique is a method of growing seedless cucumbers in a nutrient solution that flows across the plant roots. The growing channels are made from plastic and run on a slope of 1:75. This system offers some advantages as compared to soil grown crops, e.g., better water and nutrient management. About 12 weeks after planting, the root mass is very thick and starts to deteriorate. A physiological root decay and lack of oxygen has been implicated.

   An observation trial was conducted to determine if sodium silicate and ferrum phosphate could extend the life of roots and retard physiological decay. Ferrum phosphate is a homoeopathic preparation and is supposed to act as an oxygen carrier.

   Seeds of 3 trial cultivars PSR 56985, 61385 and 63585 (Peto Seed Co., U.S.A.) and Corona (De Ruiter, U.S.A.) were seeded in 10 cm rockwool blocks on March 4, 1987. Germination was 100% at 27°C block temperature, which was maintained by using electrical bottom heat. A dilute nutrient solution with an electrical conductivity of 1.5 millisiemens/cm was used, starting on the 10th day after seeding. The composition of nutrient solution is given below.

The plants were placed in Nutrient Flow Hydroponic System on April 15th, when they were at the 6 leaf stage. The system consisted of a 35 cm wide, 10 cm high side wall, wooden channels, placed on a slope of 1:75. These wooden channels were lined with 4 ml thick black plastic. The plants were placed inside the plastic which was then folded to cover the rockwool blocks.

The recirculating system worked on a 5 minutes ON and 5 minutes OFF cycle, so that nutrients would be delivered at one end of the growing channel at a rate of 2 L/minute.

Nutrient composition was as follows:

Potassium nitrate	75-100g/100L
Monopotassium phosphate	25- 50g/100L
Calcium nitrate	50- 80g/100L
Magnesium sulfate	50- 70g/100L
Iron chelate	3- 7 PPM
Manganese	2- 2.8 PPM
Copper	0.10 PPM
Zinc	0.12 PPM
Boron	0.32 PPM
Molybdenum	0.08 PPM

The pH was maintained between 6.2 - 6.5 using 85% phosphoric acid, and electrical conductivity (E.C.) between 1.5 - 2.5 millisiemens. However, the E.C. was maintained below 1.5 millisiemens, when day temperature was above 27°C.

The plant density was 2.5 plants/m^2. There were two separate NFT systems and there were 8 plants per cultivar, 32 plants each treatment.

The plants were grown at a day and night temperature of 27 and 20°C respectively. A CO_2 level of 1000 ppm was always maintained even at full ventilation.

Ferrum phosphate 6x was added at a rate of 400 tablets/300L nutrient solution starting June 15, 1987. Sodium silicate was added at 100 ppm SiO_3/ once a week.

Harvest started on May 15th and crop terminated on September 2, 1987. Plants were trained on an umbrella system.

Results:

Table VI. Effect of Ferrum Phosphate on the yield of seedless cucumbers

Cultivar	Number of Cucumbers/Plant	kg/plant Marketable	kg/plant Culls	kg/m^2	Avg.Wt./ Cucumber
Corona	53	22.4	0.43	56.0	430.9
PSR 56985	58	25.4	1.30	63.5	459.3
PSR 61385	55	24.0	1.63	60.0	466.0
PSR 63585	51	21.6	2.09	54.0	464.6

Table VII. Effect of Sodium Silicate on the yield of seedless cucumbers.

Cultivar	Number of Cucumber/Plant	kg/plant Marketable	kg/plant Culls	kg/m^2	Avg.Wt./ Cucumber
Corona	54	26.2	0.15	65.50	488.0
PSR 56985	49	21.4	1.79	53.50	473.3
PSR 61385	53	22.1	1.20	55.25	439.8
PSR 63585	60	26.4	0.85	66.00	454.3

Observation and Conclusions:

It was observed that after the addition of ferrum phosphate and sodium silicate in two separate experiments, the root decay was slowed down and new roots regenerated. As compared to previous observations on control experiments, a useful crop life of an additional 5 weeks was obtained.

The total production was exceptionally high and this is attributable to day time Co_2 enrichment, proper temperature and nutrient management.

The crop termination was due to root decay. The mechanism of actions are not fully known, but it is suspected that oxygen is involved. The exact mechanism of action of Homoeopathic ferrum phosphate, is not known.

Acknowledgements:

The authors wish to acknowledge the useful advice and encouragement of Dr. H.S. Sandhar, Natural Homoeopathic Clinic of Edmonton, and also for an abundant supply of ferrum phosphate.

2. Observations on the Production of Chinese Broccoli

Cultivars Guy-Lou and Guy-La were seeded in 5 cm peat pots on April 23 and transplanted into benches containing a commercial soilless mix on May 5 with a planting density of 12.5 and 20 cm^2. The first harvest was on May 28 and others on June 6, 23, July 2, 15 and 24. Chinese broccoli has a good breaking habit. The quality of the product was excellent.

Cultivar Guy-Lou produced 5.6 kg/m^2 at a density of 12 cm^2/plant and 4.7 kg/m^2 at 20 cm^2 density. Cultivar Guy-La produced 8.5 kg/m^2 at 12 cm^2/plant and 7.2 kg/m^2 at 20 cm^2 density.

The second harvest yielded maximum marketable product. Chinese Broccoli appears to be a good crop to be grown under greenhouse conditions.

3. Comparison of Direct Seeding and Transplanting on the Yield of Mustard Spinach (Komatusua)

An unspecified cultivar of Mustard Spinach was either directly seeded or transplanted into a peat based growing media. Harvest was 1.45 kg/m^2 on the May 4 transplanted and May 19 harvested crop, while it was 1.58 kg/m^2 on the May 1 direct seeded and May 26 harvested crop. On a June 15 transplanted crop, harvest was 1.75 kg/m^2 and a June 22 direct seeded crop yielded 2.7 kg/m^2. The quality was excellent and the crop was fast growing.

4. Yield Potential of Coriander under Greenhouse Condition

Coriander is a popular herb for some ethnic groups and is primarily used as a fresh plant. Our trials indicated that it could be an economical crop.

Coriander seed was broadcast on May 26, in 1.8 m^2 benches in a soilless medium. First harvest (leaves only) took place on June 19 the and second on June 24, with a total yield of 1.9 kg/m^2. The flavor and quality was excellent. A second crop, seeded on June 23, harvested on July 21 July 26 yielded 1.8 kg/m^2. Coriander is susceptible to aphids and thrips.

5. Gerbera production trial

'Gigi Mix' were seeded on May 14, 1986; the resultant plants were transplanted to 10 cm plastic pots on June 6, 1986 and then planted in 10 L plastic containers on June 22, 1986. The harvest started on August 22, 1986. A total of 50 plants were used in this trial. Final data was taken on August 13, 1987, and included the number of flowers per plant, flower stem length and general quality.

A total of 1563 flowers were picked in the 13 months thus producing an average of 31.26 flowers per plant. The greater maximum number of flowers were picked during March, April and May.

Eighty percent of the flowers were grade 1.A; serious thrip damage to flowers occurred on July and August.

Tissue Culture - Kris Pruski

1. Saskatoon propagation:

A total of 4300 tissue-cultured saskatoon plants were produced and distributed to growers by June, 1987.

Cultures of new cultivars received from the Agriculture Canada Research Station, Morden, Manitoba, have been established. Release of first plants of these cultivars is planned for June, 1988.

Rooting is still the major problem in micropropagation of saskatoons, especially in certain cultivars. An experiment with different explant sources was designed to determine whether the location of the explant on the source plant has the influence on rooting of shoots. Explant were taken from:

1) suckers,
2) middle part of a saskatoon bush and
3) from the top part.

During culturing the multiplication ratio was observed as well. Preliminary studies indicate that shoots obtained from cultures derived from sucker explants root better than the others. Ninety seven percent rooting was observed with cultures from suckers, 75-80% with cultures from the top part of a bush and 45-53% from the middle part. Plantlets were rooted on the greenhouse bench under mist. Multiplication ratio in cultures was also slightly higher with those from suckers than with others indicating that the juvenile tissue responds better in culture and rooting.

Rooting of cuttings obtained from tissue-cultured plants were also investigated. Cuttings were rooted on the greenhouse bench under mist. Rootone F was used as a rooting compound. Eighty seven to ninety six percent rooting was observed after a 3 week rooting period. All cultivars tested responded similarly.

Since June 1987, cultures of 12 cultivars of the saskatoon have been established. Release of plants from these cultivars is planned for June 1988.

2. Sour Cherry:

Three clones of sour cherry (from the University of Alberta) have been established successfully. Release of first plants is planned for the Spring 1988. One hundred percent rooting was achieved in preliminary studies. The purpose of this project is to gain familiarity with the sour cherry, as it has potential as a crop for in Alberta.

3. Chokecherry:

One clone of chokecherry has been established successfully. The purpose of this study was to multiply a valuable chokecherry plant (disease resistant) which was selected at Len Pearson's orchard in Bowden, Alberta. No problems with culturing were observed and rooting was 96%, the expected release of the first 100-200 plants is Spring 1988.

4. Chrysanthemum:

Micropropagation of 3 chrysanthemum mutants was investigated. Cultures were successfully established and multiplied. No problem with rooting was encountered during the course of these studies. Fifty stock plants of each mutant were produced and delivered to growers.

HORTICULTURE EXTENSION PROGRAM - Betty Vladicka

Gardening is increasing in popularity. It has become one of the top five leisure activities in North America. The increased interest has been accompanied by an increased demand for goods, services and information. Based on a recent survey of single family, privately owned, urban households, it is estimated that this segment of Alberta households spends over $90 million annually on gardening supplies and plant materials.

Maintaining satisfied gardening consumers is essential for the growth of the horticultural industry, especially the ornamentals sector. In order to maintain their plantings, consumers are increasing their demand for horticultural information. Extension activities produce indirect but tangible benefits in the development of markets for horticultural products and services.

Staff at the Alberta Tree Nursery and Horticulture Centre provide information to the general public in a number of ways. Telephone inquiries increased by 15% compared to last year's total. Although there have been staff reductions, inquiries have increased by 74% over the last five years. The hortline, a taped telephone message, increased in popularity.

The gardening courses that are offered through the offices of the district agriculturists and home economists are popular. In addition to the three courses offered in each of the six regions, our office presented another six courses. The three most popular topics were landscaping, yard maintenance and vegetable gardening. Extension staff were also asked to speak at Farm Women's Conference, and meetings of the Women's Institute, growers' associations, and horticulture societies.

Horticulture Extension participated in the Crops of Alberta demonstration area. Our horticulture plots, immediately south of the J.G. O'Donoghue Building, drew enough interest that the section will again cooperate in the demonstration area in 1988. Materials were also provided for demonstration gardens in the Boyle and Smoky Lake areas. A tour of several gardens, including the demonstration area, was given in July in the Boyle area.

In addition to the telephone assistance, a basic diagnostic service is offered to the industry and the general public. Over 140 plant samples were examined in 1987. Problems vary considerably. The snow storm in May led many home owners to bring in samples but staff have also noticed an increase in problems caused by pesticide misuse.

Reports were provided for commercial turf and home yard soil samples tested by the department's Soil and Animal Nutrition Lab.

The number of samples tested by the Lab has dropped and this was reflected in our own statistics. The number of soil reports dropped by 23%.

Mass media channels were also used to provide information. Staff utilized the department's Call of the Land and Agri-News. Interviews with several local radio and television stations were handled throughout the year. Articles were also written for several local newspapers.

The industry, especially garden centres, and the public find the horticultural publications produced by the department very useful. The Horticulture Guide and Backyard Pest Management were distributed in bulk quantities to garden centers and nursery operators.

The publication Judging Standards for Horticultural Shows was reprinted with major revisions. The extension horticulturist served as a technical advisor for another chapter of the University of Alberta correspondence course in home gardening.

In addition to providing direct assistance to the public, this office also supports the urban municipalities that provide a horticultural information service. Grants are provided to help offset operational costs. The cities of Lethbridge, Edmonton, Calgary and Red Deer participated in the program in 1987.

The newsletter Horticulture Extension Notes is circulated to individuals, private and public, that provide consulting services. A plant disease diagnostic workshop was conducted for these individuals.

Although the turf program was abolished two years ago, the section still receives requests for information from turf maintenance companies and individuals interested in establishing sod farms. Assistance was given to two major yard maintenance companies that were expanding their operations into Alberta.

In addition to the extension functions, the extension horticulturist also serves as a liaison between the horticulture branches and associations, agencies and institutions involved with non-commercial horticulture, these include:

- ex-officio director of the Alberta Horticultural Association (AHA) and several of its committees.
- coordinator of the AHA education program, and editor of the Alberta Horticulturist
- ex-officio director of the Board of Trustees of the Friends of the University of Alberta Devonian Botanic Gardens
- secretary of the Horticultural Extension and Advisory Committee
- secretary for the Western Canadian Society for Horticulture

Table VIII. Statistics for 1987.

MONTH	TELEPHONE INQUIRIES	HORTLINE	SOIL REPORTS	PUBLICATIONS	OFFICE VISITS	PLANT SAMPLES
January	140	237	7	780	7	3
February	180	237	41	1,430	5	1
March	250	250	25	9,640	5	1
April	720	247	26	37,340	8	5
May	1,360	615	137	4,880	16	23
June	980	647 *	49	600	30	40
July	925	515 *	39	1,106	24	37
August	560	346 *	32	2,630	19	20
September	630	435	56	300	11	14
October	390	360	33	860	4	1
November	220	222	33	330	3	2
December	60	167	--	85	2	1
TOTAL	6,415	4,278	478	59,981	134	148

* technical difficulties resulted in less than actual calls being recorded.

VEGETABLE EXTENSION PROGRAM - Belinda Choban

The commercial fresh vegetable industry in central-northern Alberta had another excellent year. Production increased and marketing was successful.

The program at this Centre was responsible for providing leadership to growers and industry in production and marketing of Alberta fresh vegetables.

Extension of Production Information:

Strong grower communication contact is maintained through the following ways:

1) Produce Notes Newsletter - several issues written containing production, marketing, equipment, up coming events and news.

2) Personal communications by telephone (over 650 calls), growers visiting the Centre (over 55 walk-ins) and farm visits (over 45 visits).

3) Seminars and Courses:

    a) Market Gardening for Newcomers (55 attended)
    b) Sprayer Work Shop
    c) Equipment Representative Sales Night (by EKKO representatives)
    d) Machinery Tour
    e) Course on Production Quality of Carrots and Broccoli

4) Attending courses:

    a) Financial Management Course on budgeting

5) Attending meetings of related organizations, committees and other institutes:

    a) Alberta Fresh Vegetable Marketing Board - assisted with the production of a video which promotes the Alberta fresh vegetable industry

    b) Alberta Horticulture Advisory Committee

    c) Alberta Special Crops and Horticulture Research Center - utilized proven research for this area.

6) Radio Talks

    - three, 3 minute short talks promoting the industry

7) Equipment Loan Program

- a good opportunity for growers to familiarize themselves with the required specialized equipments

8) Annual Farmer Barbecue

- had 200 growers; was a good opportunity for growers to exchange information

Marketing Extension:

1987 was a very successful year in dealing with the wholesale marketing needs of growers. A great deal of effort was put into making the Marketing Co-op a success. This co-op called Sun Fresh Farms Co-op, bulk buys processing supplies (boxes, bags, wax, ties, etc.) and markets grower members' product through the wholesale outlets. It has a general manager and ships out of the Edmonton Potato Growers' warehouse. The Co-op also purchased a 10-T per hour ice machine, thus with the availability of ice and the use of the Centre's hydro cooler, the Co-op was able to solve one of the major complaints wholesalers had with Alberta fresh broccoli - the inability to cool the produce after harvest. This has greatly helped the broccoli sales and has resulted in doubling the acreage in production.

In addition to the cole crops and roots crops marketed in 1986, the Co-op marketed spinach, lettuce, peas and bunched vegetables in 1987. This enabled wholesalers to buy locally and encouraged grower members to increase acreage production and expand to other crops.

The Co-op marketed $1.2 million worth of produce in the 1987 fiscal year from 31 grower members producing on 700 acres and 80,000 square feet of greenhouses.

Assistance was also provided with marketing promotions to help promote fresh quality of Alberta Produce and the Better Buy Alberta aspect. This was done through extensive press coverage during the summer and through an "in store" promotion held at three different outlets.

FARM OPERATIONS - Albert Faulkner

Zero cultivation of fallow areas was practiced, but regular cultivation on seedbeds and pathways was followed. Mowing of grass areas and along the fences was performed as required. Damage caused to the fence by two vehicles was repaired.

Trees and shelterbelts were pruned or removed as required, some of which was made necessary by the tornado and by beavers.

Major repairs to the farm equipment was contracted out, minor repairs and regular maintenance was undertaken in our own shops. This resulted in very little down time and more efficient operations.

Four major pieces of equipment were received in 1987 and 12 smaller items.

Statistics:

4,400 kg of fertilizer was applied to 27.43 ha. 3,880 kg oats seeded on 41.27 ha and 136.08 kg peas seeded on 2.02 ha for gree manure. 1,447.5 kg of crested wheat grass seeded on 19.3 ha on non-productive land. 3,306 cu yds manure applied to 35 ha. 21,169,080 litres of water was applied through the irrigation system to field stock.

PUBLICATIONS:

'Judging Standards for Horticulture Shows' - major revision and reprinting.

'Landscaping Alberta Yards' - minor revisions and reprinting.

'Poinsettia Production' - updated.
'Bedding Plant Production' - updated.

'Hydroponics: A Guide to Soilless Production' - updated.

PAPERS:

Casement, E.B. 1987. "Management of Woody Plants in the Production Nursery". Alaska Greenhouse and Nursery Conference, Ancorage, February.

Mohyuddin, M. 1987. "Crop Management in Hydroponic Systems". American Greenhouse Vegetable Growers Association Annual Meeting, Vancouver, August.

Mohyuddin, M. 1987. "Bedding Plant Production" and "Alberta Greenhouse Industry". Nova Scotia Greenhouse Growers Association Annual Meeting, Truro, November.

Vladicka, B. 1987. "Home Gardener - Myth or Megabucks". Proceedings of the 43rd Annual Convention of the Western Canadian Society for Horticulture, Regina, February.